

In the Claims

1 (currently amended). A prosthesis comprising:

a vessel-like structure having a first end adapted for surgical attachment to a left ventricle, a second end adapted for surgical attachment to an aorta, and, interposed between the first and second ends, a sinus portion configured in the shape of the sinuses of Valsalva in a human aortic valve, wherein said vessel-like structure is composed of a synthetic material.

2 (original). The prosthesis according to claim 1, wherein said sinus portion comprises an ostium.

3 (currently amended). The prosthesis according to claim 2, wherein an artificial ~~or a non-artificial~~ vessel is connected to said ostium.

4 (original). The prosthesis according to claim 1, wherein said sinus portion comprises three sinus cavities.

5 (original). The prosthesis according to claim 4, wherein at least two of said sinus cavities each comprise an ostium.

6 (previously presented). The prosthesis according to claim 1, wherein said vessel-like structure further comprises a valve for regulating fluid flow.

7 (original). The prosthesis according to claim 6, wherein said valve comprises animal tissue.

8 (original). The prosthesis according to claim 6, wherein said valve does not comprise animal tissue.

9 (original). The prosthesis according to claim 8, wherein said valve is a caged ball valve, a tilting disc valve, a bileaflet valve, or a trileaflet valve.

10 (previously presented). The prosthesis according to claim 1, wherein said first end or said second end or both said first end and said second end of said vessel-like structure comprise a sewing ring.

11 (original). The prosthesis according to claim 10, wherein said sewing ring comprises a biocompatible elastomeric material.

12 (original). The prosthesis according to claim 10, wherein said sewing ring comprises a polymer material.

13 (original). The prosthesis according to claim 12, wherein said polymer material is covered with a woven biocompatible material.

14 (original). The prosthesis according to claim 2, wherein attached to said ostium is an ostium attachment ring.

15 (original). The prosthesis according to claim 14, wherein an artificial or a non-artificial vessel is connected to said ostium attachment ring.

16 (previously presented). The prosthesis according to claim 2, wherein said ostium is located at a position on said sinus for optimal fluid dynamics and blood flow.

17 (original). The prosthesis according to claim 16, wherein said ostium is located about 10 to 20 mm from the base of said sinus.

18 (original). The prosthesis according to claim 16, wherein said ostium is located about 12 to 18 mm from the base of said sinus.

19 (original). The prosthesis according to claim 16, wherein said ostium is located about 14 to 16 mm from the base of said sinus.

20 (original). The prosthesis according to claim 16, wherein said ostium is located about 15 mm from the base of said sinus.

21 (previously presented). The prosthesis according to claim 1, wherein said vessel-like structure or a portion thereof is composed of a material selected from the group consisting of stainless steel, titanium, chromium, a metal alloy, polycarbonate polymer, polysulfone, polyurethane, polytetrafluoroethylene, and a blend of polyurethane and polysiliconurethane.

22 (previously presented). The prosthesis according to claim 1, wherein said vessel-like structure or a portion thereof comprises a coating to render said structure more biocompatible.

23 (previously presented). The prosthesis according to claim 1, wherein said vessel-like structure or a portion thereof comprises a coating comprising one or more compositions selected from the group consisting of an antibiotic, anticoagulant, antithrombogenic, antiproliferative, antiplatelet, antiinflammatory, antioxidant, and a pharmaceutical agent.

24 (previously presented). The prosthesis according to claim 1, wherein said vessel-like structure or a portion thereof comprises a coating to render said structure more hemostatic.

25 (canceled).

26 (previously presented). The prosthesis according to claim 5, wherein said ostium is located at a position on said sinus for optimal fluid dynamics and blood flow.

27 (previously presented). The prosthesis according to claim 26, wherein said ostium is located about 10 to 20 mm from the base of said sinus.

28 (previously presented). The prosthesis according to claim 26, wherein said ostium is located about 12 to 18 mm from the base of said sinus.

29 (previously presented). The prosthesis according to claim 26, wherein said ostium is located about 14 to 16 mm from the base of said sinus.

30 (previously presented). The prosthesis according to claim 26, wherein said ostium is located about 15 mm from the base of said sinus.

31 (previously presented). A method for replacing an ascending aorta in a human or animal, the method comprising the step of:

- a) removing the ascending aorta present in the human or animal; and
- b) implanting the prosthesis of claim 1 into the human or animal.

32 (new). The prosthesis according to claim 5, wherein an artificial vessel is connected to said ostium.